

Customer Training Catalog Course Descriptions LTE Product Technical Training



HUAWEI
HUAWEI Learning Service
2015

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1.1 Training Course Descriptions

LTE Product Technical Training Training Courses are designed as follows:

Code	Training Courses	Level	Duration (working days)	Training Location	Class Size
Principle Training Courses					
OEA11	LTE Industry Briefing and Network Deployment (GUL)	II	1		6 ~ 12
OEA03	LTE System Overview	I	1		6 ~ 12
OEA04	LTE Air Interface	II	2		6 ~ 12
OEA15	LTE Protocols and Procedures	II	2		6 ~ 12
OE002	LTE-A Key Technology Overview	II	0.5		6 ~ 12
OEA07	TCP/IP in the Mobile World	II	1		6 ~ 12
RNO Training Courses					
OEO51	LTE eRAN3.0 Basic Features and Algorithms	III	3.5		6 ~ 12
OEO61	LTE eRAN6.0 Basic Features and Algorithms	III	4		6 ~ 12
OEO71	LTE eRAN7.0 Basic Features and Algorithms	III	4		6 ~ 12
OEO52	LTE eRAN3.0 SON Features and Algorithms	III	1		6 ~ 12
OEO62	LTE eRAN6.0 SON Features and Algorithms	III	1		6 ~ 12
OEO72	LTE eRAN7.0 SON Features and Algorithms	III	1		6 ~ 12
OEO53	LTE eRAN3.0 TDD Specific Features and Algorithms	III	0.5		6 ~ 12
OEO63	LTE eRAN6.0 TDD Specific Features and Algorithms	III	0.5		6 ~ 12
OEO73	LTE eRAN7.0 TDD Specific Features and Algorithms	III	0.5		6 ~ 12
OEO54	LTE eRAN3.0 Performance Improving Features and Algorithms	III	2		6 ~ 12
OEO64	LTE eRAN6.0 Performance Improving Features and Algorithms	III	2		6 ~ 12
OEO74	LTE eRAN7.0 Performance Improving Features and Algorithms	III	2		6 ~ 12
OEO57	LTE eRAN3.0 Enhanced Features	III	0.5		6 ~ 12
OEO56	LTE eRAN3.0 New Features	III	0.5		6 ~ 12

OEO67	LTE eRAN6.0 Enhanced Features	III	0.5		6 ~ 12
OEO66	LTE eRAN6.0 New Features	III	0.5		6 ~ 12
OEO77	LTE eRAN7.0 Enhanced Features	III	0.5		6 ~ 12
OEO76	LTE eRAN7.0 New Features	III	0.5		6 ~ 12
OEO01	LTE Network Tuning	III	1		6 ~ 12
OEO03	LTE Performance Management	III	1		6 ~ 12
OEO06	LTE Radio Network Optimize	IV	2		6 ~ 12
OE025	LTE Interoperability	IV	1		6 ~ 12
RNP Training Courses					
OEP01	LTE Radio Network Design	III	1.67		6 ~ 12
OEP02	LTE Access Transport Network Dimensioning	III	0.33		6 ~ 12
Product Training Courses					
OEB50	eNodeB V100R005 Product Description	I	0.5		6 ~ 12
OEB60	eNodeB V100R006 Product Description	I	0.5		6 ~ 12
OEB70	eNodeB V100R007 Product Description	I	0.5		6 ~ 12
OEB51	eNodeB V100R005 Local Commissioning	I	1		6 ~ 12
OEB61	eNodeB V100R006 Local Commissioning	I	1		6 ~ 12
OEB71	eNodeB V100R007 Local Commissioning	I	1		6 ~ 12
OEB52	eNodeB V100R005 Field Maintenance	I	0.5		6 ~ 12
OEB62	eNodeB V100R006 Field Maintenance	I	0.5		6 ~ 12
OEB72	eNodeB V100R007 Field Maintenance	I	0.5		6 ~ 12
OEB63	eNodeB V100R006 Equipment Commissioning	II	0.5		6 ~ 12
OEB73	eNodeB V100R007 Equipment Commissioning	II	0.5		6 ~ 12
OEB54	eNodeB V100R005 Operation	II	1		6 ~ 12
OEB64	eNodeB V100R006 Operation	II	1		6 ~ 12
OEB74	eNodeB V100R007 Operation	II	1		6 ~ 12
OEB55	eNodeB V100R005 Initial Configuration	II	1		6 ~ 12
OEB65	eNodeB V100R006 Initial Configuration	II	3		6 ~ 12

OEB75	eNodeB V100R007 Initial Configuration	II	3		6 ~ 12
OEB56	eNodeB V100R005 Troubleshooting	II	1		6 ~ 12
OEB66	eNodeB V100R006 Troubleshooting	II	2		6 ~ 12
OEB76	eNodeB V100R007 Troubleshooting	II	2		6 ~ 12
NA	eNodeB LTE V100R007 Troubleshooting of Transmission	III	0.5		6 ~ 12
NA	eNodeB LTE V100R007 Troubleshooting of Antenna & Feeder System	III	1.5		6 ~ 12
OEB57	eNodeB V100R005 Reconfiguration	II	1.5		6 ~ 12
OEB67	eNodeB V100R006 Reconfiguration	II	1		6 ~ 12
OEB77	eNodeB V100R007 Reconfiguration	II	2		6 ~ 12
OEB58	LTE eRAN3.0 O&M Enhancement	III	0.5		6 ~ 12
OEB68	LTE eRAN6.0 Product Delta	III	1		6 ~ 12
OEB78	LTE eRAN7.0 Product Delta	III	1		6 ~ 12
OET58	LTE eRAN3.0 Transmission Features and Algorithms	III	1		6 ~ 12
OET68	LTE eRAN6.0 Transmission Features and Algorithms	III	1		6 ~ 12
OET78	LTE eRAN7.0 Transmission Features and Algorithms	III	1.5		6 ~ 12
WBT					
OEA00	LTE SAE System Overview(WBT)	I	4hours		6 ~ 12
OEA01	LTE in a Nutshell (WBT)	I	0.5hour		6 ~ 12

1.2 Principle Training Course Descriptions

1.2.1 OEA11 LTE Industry Briefing and Network Deployment (GUL)



Objectives

On completion of this course, the participants will be able to:

- Outline Incentive of LTE
- Describe various services and trends provided by LTE
- Overview evolution of radio technologies
- Describe network architecture of EPS(E-UTRAN and EPC)
- Explain key technologies of LTE, such as OFDM/SC-FDM, MIMO
- Brief LTE industry chain development
- Outline LTE overall network evolution deployment scenario such as interoperability strategy, voice strategy etc.

Target Audience

Business Developer
Fundamentals

Prerequisites

- A general knowledge in cellular systems and radio technology

Content

- Incentive of LTE
- Services of LTE
- LTE Key Technologies
- Evolution of Radio Technologies
- LTE Network Architecture
- OFDM Technologies
- MIMO Technologies
- SON Technologies
- LTE Industry Chain Development
- LTE Radio Network Evolution Deployment
- LTE Core Network Evolution Deployment
- LTE Transmission Network Evolution Deployment

Training Methods

Lectures

Duration

1 working day

Class Size

Min 6, max 12

1.2.2 OEA03 LTE System Overview



Objectives

On completion of this course, the participants will be able to:

- Describe the evolution of cellular networks
- Summarize the evolution of 3GPP releases
- Explain the logical architecture of EPS (E-UTRAN and EPC)
- Give an overview of the interfaces in EPS
- Describe the Evolved Packet Core (EPC)
- Describe the role of the MME and the S-GW
- Describe the S1, X2 and radio-interface and their protocol stacks
- Describe the radio interface techniques used in uplink and downlink
- Describe the channel structure of the radio interface
- Describe the time-domain and Frequency-domain structure in the radio interface in UL and DL for both FDD and TDD mode
- Have a good understanding of the OFDM principle, signal generation and processing
- Detail the reference symbols in DL
- Describe MIMO technology
- Have a good understanding of the SC-FDMA principle, signal generation and processing
- Describe Huawei eNodeB Family
- Describe Huawei LTE products and application scenarios
- Describe Huawei LTE products Operation and Maintenance System

Target Audience

Field Technician
Service Technician
System Technician
Network Deployment Engineer

Service Engineer

Service Design Engineer

Service Planning Engineer

System Engineer

Prerequisites

- A general knowledge in cellular systems and radio technology

Content

- Network Architecture
- Evolution of Cellular Networks
- 3GPP Releases
- E-UTRAN Architecture
- E-UTRAN Interfaces and Protocols
- EPC Architecture
- EPC Interfaces and Protocols
- LTE Air Interface Principles
- Radio Interface Techniques
- Principles of OFDM
- LTE Channel Structures
- LTE Frame Structure
- Downlink OFDMA
- Uplink SC-FDMA
- Multiple Input Multiple Output
- Multimedia Broadcast Multicast Service
- eNodeB Product Overview
- The Huawei eNodeB family
- Products and application scenarios

Operation and Maintenance Training Methods

Lectures

Duration

1 working day

Class Size

Min 6, max 12

1.2.3 OEA04 LTE Air Interface



Objectives

On completion of this course, the participants will be able to:

- Describe the evolution of cellular networks
- Summarize the evolution of 3GPP releases
- Describe the radio interface techniques
- Explain the difference between the FDD and TDD mode
- Describe the flexible spectrum usage
- Outline the concepts of channel coding
- Describe the principle for OFDM
- Have a good understanding of the OFDMA/SC-FDMA principle, signal generation and processing
- Explain the pros and cons with OFDMA and SC-FDMA
- Outline the radio interface protocols
- Detail the time-domain and frequency-domain structure in the radio interface in UL and DL for both FDD and TDD mode
- Detail the channel structure of the radio interface
- Detail the frame structure of the radio interface
- Describe the uplink/downlink physical signals
- Detail the uplink/downlink control signaling and formats
- Detail the uplink/downlink reference symbols
- Detail the uplink/downlink transmission technique
- Detail the paging procedures
- Explain the cell search procedure
- Detail the random access procedure
- Describe the uplink/downlink power control
- Explain HARQ
- Describe the concepts of layers, channel rank, spatial multiplexing, open and closed loop spatial multiplexing, TX diversity, beamforming, SU-MIMO and MU-MIMO

Target Audience

- Service Engineer
- Service Design Engineer
- Network Design Engineer

Prerequisites

- Attendees should have a general knowledge in cellular systems and radio technology.

Content

- The evolution of cellular networks
- The evolution of 3GPP releases
- Radio interface techniques
- Difference between the FDD and TDD mode
- Flexible spectrum usage
- Concepts of channel coding
- Principle for OFDM
- OFDMA/SC-FDMA principle, signal generation and processing
- Pros and cons with OFDMA and SC-FDMA
- Radio interface protocols
- Time-domain and frequency-domain structure in the radio interface in UL and DL for both FDD and TDD mode
- Channel structure of the radio interface
- Frame structure of the radio interface
- Uplink/downlink physical signals
- Uplink/downlink control signaling and formats
- Uplink/downlink reference symbols
- Uplink/downlink transmission technique
- The paging procedure
- The cell search procedure
- The random access procedure
- Uplink/downlink power controls
- HARQ
- Concepts of layers, channel rank, spatial multiplexing, open and closed loop spatial multiplexing, TX diversity, beamforming, SU-MIMO and MU-MIMO

Training Methods

Lectures

Duration

2 working days

Class Size

Min 6, max 12

1.2.4 OEA15 LTE Protocols and Procedures



Objectives

On completion of this course, the participants will be able to:

- Describe the evolution of cellular networks
- Explain the main functions of EPS network element
- List the interfaces in EPS and the protocol of EPS interfaces
- Explain how signaling takes place between the UE and the EPC
- Brief the main functions of Non Access Stratum(NAS), Radio Resource Control (RRC), Packet Data Convergence Protocol (PDCP) Radio Link Control (RLC), Medium Access Control (MAC), the physical layer and their relations
- Explain the purpose of EPS Bearer Services and eUTRA Radio Bearer

Explain the concept, principle and signaling flow of typical procedure, such as UE access procedure, paging, TAU, handover etc. Target Audience

Service Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface

Content

- The evolution of cellular networks

- EPS network element
- EPS interfaces
- The main functions of Non Access Stratum(NAS), Radio Resource Control (RRC), Packet Data Convergence Protocol (PDCP) Radio Link Control (RLC), Medium Access Control (MAC), the physical layer and their relations
- EPS Bearer Services and eUTRA Radio Bearer
- The concept, principle and signaling procedure of UE access network
- The concept, principle and signaling procedure of default bearer
- The concept, principle and signaling procedure of special bearer
- The concept, principle and signaling procedure of paging
- The concept, principle and signaling procedure of TAU
- The concept, principle and signaling procedure of Handover

The concept, principle and signaling procedure of detach Training Methods

Lectures, Hands-on exercise, Demo

Duration

2 working days

Class Size

Min 6, max 12

1.2.5 OE002 LTE-A Key Technology Overview



Objectives

On completion of this course, the participants will be able to:

- Describe LTE Describe -A requirements and 3GPP schedule
- Describe benefit and principle of LTE-A key technology
- Huawei LTE-A cases study

Target Audience

Service Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- LTE Air Interface
- LTE eRAN3.0 Features and Algorithms

Content

- LTE-A requirements and 3GPP schedule
- Benefit and principle of CA(Carrier Aggregation)
- Benefit and principle of high order MIMO
- Benefit and principle of CoMP (Coordinated Multi-Point transmission/reception technology)
- Benefit and principle of eICIC (Inter-Cell Interference Coordination)
- HetNet concept introduction
- LTE-A application cases

Training Methods

Lectures

Duration

0.5 working day

Class Size

Min 6, max 12

1.2.6 OEA07 TCP/IP in the Mobile World



Objectives

On completion of this course, the participants will be able to:

- Learn about IP protocol release specifications and common RFC standards
- Learn about common IP RAN concepts such as the MSTP and PTN
- Understand the TCP/IP protocol structure, and learn common technologies such as the VLAN and DSCP
- Learn the protocol stack composition on IP RAN interfaces
- Learn the IP components, and understand the data exchange process
- Be familiar with common IP RAN devices and maintenance applications
- Learn about differences among the IP, ATM, and TDM technologies, and problems caused by IP-based networking

Target Audience

System Engineer
Service Engineer

Service Planning Engineer

Service Design Engineer

Network Design Engineer

Prerequisites

- A general knowledge in cellular systems and radio technology

Content

- IP protocol origin
- IP network topology structure
- OSI model and TCP/IP protocol structure
- IP address Introduction
- IP subnet division and Exchange Foundation

IP ATM, TDM comparison Training Methods

Lectures

Duration

1 working day

Class Size

Min 6, max 12

1.3 RNO Training Course Descriptions

1.3.1 OEO51 LTE eRAN3.0 Basic Features and Algorithms



Objectives

On completion of this course, the participants will be able to:

- Outline idle mode
- Describe PLMN selection
- Describe cell selection and cell reselection
- Config cell selection
- Config cell reselection measurement
- Describe system information reception
- Config SIB
- Describe tracking area registration
- Describe paging monitoring procedure
- Outline mobility management
- Describe intra-frequency handover
- Describe inter-frequency handover
- Describe inter-rat handover
- Set measurement configuration
- Set handover related parameters
- Outline power control
- Describe downlink power control
- Describe uplink power control
- Set initial power
- Outline scheduling
- Describe downlink scheduling
- Describe uplink scheduling
- Describe scheduling deployment strategy
- Describe basic principles of QoS management
- Describe QoS management policies
- Describe QoS management methods
- List when to use QoS management
- Outline MIMO feature
- Describe multiple-antenna reception/transmission MIMO
- Describe multiple-antenna transmission MIMO
- Describe adaptive mode selection and switching of MIMO
- Set adaptive MIMO
- Describe PDCCH/PUCCH resource management feature
- parameters
- Outline LTE voice solutions
- Outline CS Fallback
- Describe CS Fallback procedure
- Draw network architecture for CS Fallback to UTRAN/GERAN
- Describe CS Fallback to UTRAN/GERAN
- Select CS Fallback mechanisms
- Perform configuration on eNodeB for CS Fallback

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures

Content

- Idle Mode Overview
- PLMN selection
- Cell selection
- Cell reselection
- System information reception
- Tracking area registration
- Paging monitoring procedure
- Mobility Management Overview
- Intra-frequency Handover
- Inter-frequency Handover
- Inter-RAT Handover
- Power control overview
- Downlink power control

- Uplink power control
- Overview of Scheduling
- Downlink Scheduling
- Uplink Scheduling
- Scheduling Deployment Strategy
- Overview of QoS Management
- QoS Management Policies
- QoS Management Methods
- When to Use QoS
- MIMO feature overview
- Multiple-Antenna reception MIMO
- Multiple-Antenna transmission MIMO
- Adaptive mode selection and switching
- PDCCH resource management
- PDCCH symbols adaptively adjusted
- CCE aggregation adaptively adjusted
- DL/UL CCE ratio adaptively adjusted
- PUCCH resource management
- Adaptive SR period adjustment
- Adaptive PUCCH resource adjustment
- CS Fallback Overview

- LTE Voice Solution
- CS Fallback Procedure
- Network Architecture for CS Fallback to UTRAN/GERAN
- Combined EPS/IMSI Attach Procedure
- CS Fallback to UTRAN
- CS Fallback Based on PS Redirection(UMTS)
- CS Fallback Based on PS Handover(UMTS)
- CS Fallback to GERAN
- Decisions and Configuration of eNodeB in CS Fallback
- Selection of CS Fallback Mechanisms

Training Methods

Lectures

Duration

3.5 working days

Class Size

Min 6, max 12

1.3.2 OEO61 LTE eRAN6.0 Basic Features and Algorithms



Objectives

On completion of this course, the participants will be able to:

- Outline idle mode
- Describe PLMN selection
- Describe cell selection and cell reselection
- Config cell selection
- Config cell reselection measurement
- Describe system information reception
- Config SIB
- Describe tracking area registration
- Describe paging monitoring procedure
- Outline mobility management
- Describe intra-frequency handover
- Describe inter-frequency handover
- Describe inter-rat handover
- Set measurement configuration
- Set handover related parameters
- Outline power control
- Describe downlink power control
- Describe uplink power control
- Set initial power
- Outline scheduling
- Describe downlink scheduling
- Describe uplink scheduling
- Describe scheduling deployment strategy
- Describe basic principles of QoS management
- Describe QoS management policies
- Describe QoS management methods
- List when to use QoS management
- Outline MIMO feature
- Describe multiple-antenna reception/transmission MIMO
- Describe multiple-antenna transmission MIMO
- Describe adaptive mode selection and switching of MIMO
- Set adaptive MIMO
- Describe PDCCH/PUCCH resource management feature
- parameters
- Outline CS Fallback
- Describe CS Fallback procedure
- Draw network architecture for CS Fallback to UTRAN/GERAN
- Describe CS Fallback to UTRAN/GERAN
- Select CS Fallback mechanisms
- Perform configuration on eNodeB for CS Fallback
- Outline CA Basic Concepts and Principles
- Describe CA Feature Benefit and Influence
- Perform CA Feature Deployment and Configuration
- Outline DRX basic concepts
- Describe DRX realization principles

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures

Content

- Idle Mode Overview
- PLMN selection
- Cell selection
- Cell reselection
- System information reception
- Tracking area registration
- Paging monitoring procedure
- Mobility Management Overview

- Intra-frequency Handover
- Inter-frequency Handover
- Inter-RAT Handover
- Power control overview
- Downlink power control
- Uplink power control
- Overview of Scheduling
- Downlink Scheduling
- Uplink Scheduling
- Scheduling Deployment Strategy
- Overview of QoS Management
- QoS Management Policies
- QoS Management Methods
- When to Use QoS
- MIMO feature overview
- Multiple-Antenna reception MIMO
- Multiple-Antenna transmission MIMO
- Adaptive mode selection and switching
- PDCCH resource management
- PDCCH symbols adaptively adjusted
- CCE aggregation adaptively adjusted
- DL/UL CCE ratio adaptively adjusted
- PUCCH resource management
- Adaptive SR period adjustment
- Adaptive PUCCH resource adjustment
- CS Fallback Overview
- LTE Voice Solution

- CS Fallback Procedure
- Network Architecture for CS Fallback to UTRAN/GERAN
- Combined EPS/IMSI Attach Procedure
- CS Fallback to UTRAN
- CS Fallback Based on PS Redirection(UMTS)
- CS Fallback Based on PS Handover(UMTS)
- CS Fallback to GERAN
- Decisions and Configuration of eNodeB in CS Fallback
- Selection of CS Fallback Mechanisms
- CA Basic Concepts and Principles
- CA Feature Benefit and Influence
- CA Feature Deployment and Configuration
- DRX Basic Concepts and Principles
- DRX Feature Benefit and Influence
- DRX in RRC_CONNECTED Mode
- Dynamic DRX
- High-Mobility-Triggered Idle Mode

Training Methods

Lectures

Duration

4 working days

Class Size

Min 6, max 12

1.3.3 OEO71 LTE eRAN7.0 Basic Features and Algorithms



Objectives

On completion of this course, the participants will be able to:

- Outline idle mode
- Describe PLMN selection
- Describe cell selection and cell reselection
- Config cell selection
- Config cell reselection measurement
- Describe system information reception
- Config SIB
- Describe tracking area registration
- Describe paging monitoring procedure
- Outline mobility management
- Describe intra-frequency handover
- Describe inter-frequency handover
- Describe inter-rat handover
- Set measurement configuration
- Set handover related parameters
- Outline power control
- Describe downlink power control
- Describe uplink power control
- Set initial power
- Outline scheduling
- Describe downlink scheduling
- Describe uplink scheduling
- Describe scheduling deployment strategy
- Describe basic principles of QoS management
- Describe QoS management policies
- Describe QoS management methods
- List when to use QoS management
- Outline MIMO feature
- Describe multiple-antenna reception/transmission MIMO
- Describe multiple-antenna transmission MIMO
- Describe adaptive mode selection and switching of MIMO
- Set adaptive MIMO
- Describe PDCCH/PUCCH resource

management feature

- parameters
- Outline CS Fallback
- Describe CS Fallback procedure
- Draw network architecture for CS Fallback to UTRAN/GERAN
- Describe CS Fallback to UTRAN/GERAN
- Select CS Fallback mechanisms
- Perform configuration on eNodeB for CS Fallback
- Outline CA Basic Concepts and Principles
- Describe CA Feature Benefit and Influence
- Perform CA Feature Deployment and Configuration
- Outline DRX basic concepts
- Describe DRX realization principles

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures

Content

- Idle Mode Overview
- PLMN selection
- Cell selection
- Cell reselection
- System information reception
- Tracking area registration
- Paging monitoring procedure
- Mobility Management Overview
- Intra-frequency Handover
- Inter-frequency Handover

- Inter-RAT Handover
- Power control overview
- Downlink power control
- Uplink power control
- Overview of Scheduling
- Downlink Scheduling
- Uplink Scheduling
- Scheduling Deployment Strategy
- Overview of QoS Management
- QoS Management Policies
- QoS Management Methods
- When to Use QoS
- MIMO feature overview
- Multiple-Antenna reception MIMO
- Multiple-Antenna transmission MIMO
- Adaptive mode selection and switching
- PDCCH resource management
- PDCCH symbols adaptively adjusted
- CCE aggregation adaptively adjusted
- DL/UL CCE ratio adaptively adjusted
- PUCCH resource management
- Adaptive SR period adjustment
- Adaptive PUCCH resource adjustment
- CS Fallback Overview
- LTE Voice Solution
- CS Fallback Procedure
- Network Architecture for CS Fallback to UTRAN/GERAN
- Combined EPS/IMSI Attach Procedure
- CS Fallback to UTRAN
- CS Fallback Based on PS Redirection(UMTS)
- CS Fallback Based on PS Handover(UMTS)
- CS Fallback to GERAN
- Decisions and Configuration of eNodeB in CS Fallback
- Selection of CS Fallback Mechanisms
- CA Basic Concepts and Principles
- CA Feature Benefit and Influence
- CA Feature Deployment and Configuration
- DRX Basic Concepts and Principles
- DRX Feature Benefit and Influence
- DRX in RRC_CONNECTED Mode

- Dynamic DRX
- High-Mobility-Triggered Idle Mode

Training Methods

Lectures

Duration

4 working days

Class Size

Min 6, max 12

1.3.4 OEO52 LTE eRAN3.0 SON Features and Algorithms



Objectives

On completion of this course, the participants will be able to:

- Outline ANR overview
- Describe intra-RAT ANR management
- Describe inter-RAT ANR management
- Switch on ANR
- Set ANR related parameters
- Outline MRO processing flow
- List classification of intra-RAT MRO
- Describe intra-RAT MRO management
- Describe inter-RAT MRO management
- Set MRO to optimize handover
- Outline PCI conflict detection
- self-optimization overview
- Describe PCI conflict detection
- Describe PCI self-optimization in M2000
- Observe PCI conflict information
- Set PCI conflict detection
- Outline RACH optimization
- Describe prerequisites for RACH optimization
- Describe zero correlation zone configuration
- Describe contention-based vs. contention-free random access
- Describe RACH resource adjustment
- Perform MML to deploy RACH optimization
- Describe impact of RACH optimization
- Outline cell outage detection
- Describe sleeping cell detection techniques
- Describe cell outage detection techniques
- Deploy cell outage detection

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN3.0 Basic Features and Algorithms

Content

- Describe the SON benefits
- Outline the SON functions
- Outline SON functions in M2000
- Enable the SON switches in M2000
- Check SON logs in M2000
- ANR Overview
- Intra-RAT ANR Management
- Inter-RAT ANR Management
- MRO Processing Flow
- Classification of Intra-RAT MRO
- Intra-RAT MRO Management
- Inter-RAT MRO Management
- PCI Conflict Detection
- Self-Optimization Overview
- PCI Conflict Detection
- PCI Self-Optimization in M2000
- Overview of RACH Optimization
- Prerequisites for RACH Optimization
- Zero Correlation Zone Configuration
- Contention-Based vs. Contention-Free Random Access
- RACH Resource Adjustment
- Dedicated Preamble Group Adjustment
- Multiplexing of Dedicated Preambles
- PRACH Configuration Index Adjustment
- Adaptive Backoff
- MML screenshots
- Impact of RACH Optimization
- Overview of Cell Outage Detection
- Sleeping Cell Detection Techniques
- Cell Outage Detection Techniques

-
- Engineering Guidelines

Training Methods

Lectures

Duration

1 working day

Class Size

Min 6, max 12

1.3.5 OEO62 LTE eRAN6.0 SON Features and Algorithms



Objectives

On completion of this course, the participants will be able to:

- Outline ANR overview
- Describe intra-RAT ANR management
- Describe inter-RAT ANR management
- Switch on ANR
- Set ANR related parameters
- Outline MRO processing flow
- List classification of intra-RAT MRO
- Describe intra-RAT MRO management
- Describe inter-RAT MRO management
- Set MRO to optimize handover
- Outline PCI conflict detection
- self-optimization overview
- Describe PCI conflict detection
- Describe PCI self-optimization in M2000
- Observe PCI conflict information
- Set PCI conflict detection
- Outline RACH optimization
- Describe prerequisites for RACH optimization
- Describe zero correlation zone configuration
- Describe contention-based vs. contention-free random access
- Describe RACH resource adjustment
- Perform MML to deploy RACH optimization
- Describe impact of RACH optimization
- Outline cell outage detection
- Describe sleeping cell detection techniques
- Describe cell outage detection techniques
- Deploy cell outage detection

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN6.0 Basic Features and Algorithms

Content

- Describe the SON benefits
- Outline the SON functions
- Outline SON functions in M2000
- Enable the SON switches in M2000
- Check SON logs in M2000
- ANR Overview
- Intra-RAT ANR Management
- Inter-RAT ANR Management
- MRO Processing Flow
- Classification of Intra-RAT MRO
- Intra-RAT MRO Management
- Inter-RAT MRO Management
- PCI Conflict Detection
- Self-Optimization Overview
- PCI Conflict Detection
- PCI Self-Optimization in M2000
- Overview of RACH Optimization
- Prerequisites for RACH Optimization
- Zero Correlation Zone Configuration
- Contention-Based vs. Contention-Free Random Access
- RACH Resource Adjustment
- Dedicated Preamble Group Adjustment
- Multiplexing of Dedicated Preambles
- PRACH Configuration Index Adjustment
- Adaptive Backoff
- MML screenshots
- Impact of RACH Optimization
- Overview of Cell Outage Detection
- Sleeping Cell Detection Techniques
- Cell Outage Detection Techniques

-
- Engineering Guidelines

Training Methods

Lectures

Duration

1 working day

Class Size

Min 6, max 12

1.3.6 OEO72 LTE eRAN7.0 SON Features and Algorithms



Objectives

On completion of this course, the participants will be able to:

- Outline ANR overview
- Describe intra-RAT ANR management
- Describe inter-RAT ANR management
- Switch on ANR
- Set ANR related parameters
- Outline MRO processing flow
- List classification of intra-RAT MRO
- Describe intra-RAT MRO management
- Describe inter-RAT MRO management
- Set MRO to optimize handover
- Outline PCI conflict detection
- self-optimization overview
- Describe PCI conflict detection
- Describe PCI self-optimization in M2000
- Observe PCI conflict information
- Set PCI conflict detection
- Outline RACH optimization
- Describe prerequisites for RACH optimization
- Describe zero correlation zone configuration
- Describe contention-based vs. contention-free random access
- Describe RACH resource adjustment
- Perform MML to deploy RACH optimization
- Describe impact of RACH optimization
- Outline cell outage detection
- Describe sleeping cell detection techniques
- Describe cell outage detection techniques
- Deploy cell outage detection

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN7.0 Basic Features and Algorithms

Content

- Describe the SON benefits
- Outline the SON functions
- Outline SON functions in U2000
- Enable the SON switches in U2000
- Check SON logs in U2000
- ANR Overview
- Intra-RAT ANR Management
- Inter-RAT ANR Management
- MRO Processing Flow
- Classification of Intra-RAT MRO
- Intra-RAT MRO Management
- Inter-RAT MRO Management
- PCI Conflict Detection
- Self-Optimization Overview
- PCI Conflict Detection
- PCI Self-Optimization in U2000
- Overview of RACH Optimization
- Prerequisites for RACH Optimization
- Zero Correlation Zone Configuration
- Contention-Based vs. Contention-Free Random Access
- RACH Resource Adjustment
- Dedicated Preamble Group Adjustment
- Multiplexing of Dedicated Preambles
- PRACH Configuration Index Adjustment
- Adaptive Backoff
- MML screenshots
- Impact of RACH Optimization
- Overview of Cell Outage Detection
- Sleeping Cell Detection Techniques
- Cell Outage Detection Techniques

-
- Engineering Guidelines

Training Methods

Lectures

Duration

1 working day

Class Size

Min 6, max 12

1.3.7 OEO53 LTE eRAN3.0 TDD Specific Features and Algorithms



Objectives

On completion of this course, the participants will be able to:

- Outline beamforming
- Describe beamforming-related concepts
- Describe beamforming principles and techniques
- Describe beamforming feature application scenarios
- Deploy beamforming
- Describe concept of sector, cell and TDD subframe configuration
- Draw TDD frame structure
- Describe uplink-downlink subframe configurations
- Describe configurations of special subframes
- Describe when to use subframe configuration
- Perform subframe configuration

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN3.0 Basic Features and Algorithms

Content

- Overview of Beamforming
- Beamforming-Related Concepts
- Beamforming Principles and Techniques
- Beamforming Feature Application Scenarios
- Beamforming Deployment
- Concept of Sector, cell and TDD Subframe Configuration
- TDD Frame Structure
- Uplink-Downlink Subframe Configurations
- Configurations of Special Subframes
- When to Use Subframe Configuration
- Subframe Configuration Deployment

Training Methods

Lectures

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.8 OEO63 LTE eRAN6.0 TDD Specific Features and Algorithms



Objectives

On completion of this course, the participants will be able to:

- Outline beamforming
- Describe beamforming-related concepts
- Describe beamforming principles and techniques
- Describe beamforming feature application scenarios
- Deploy beamforming
- Describe concept of sector, cell and TDD subframe configuration
- Draw TDD frame structure
- Describe uplink-downlink subframe configurations
- Describe configurations of special subframes
- Describe when to use subframe configuration
- Perform subframe configuration

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN6.0 Basic Features and Algorithms

Content

- Overview of Beamforming
- Beamforming-Related Concepts
- Beamforming Principles and Techniques
- Beamforming Feature Application Scenarios
- Beamforming Deployment
- Concept of Sector, cell and TDD Subframe Configuration
- TDD Frame Structure
- Uplink-Downlink Subframe Configurations
- Configurations of Special Subframes
- When to Use Subframe Configuration
- Subframe Configuration Deployment

Training Methods

Lectures

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.9 OEO73 LTE eRAN7.0 TDD Specific Features and Algorithms



Objectives

On completion of this course, the participants will be able to:

- Outline beamforming
- Describe beamforming-related concepts
- Describe beamforming principles and techniques
- Describe beamforming feature application scenarios
- Deploy beamforming
- Describe concept of sector, cell and TDD subframe configuration
- Draw TDD frame structure
- Describe uplink-downlink subframe configurations
- Describe configurations of special subframes
- Describe when to use subframe configuration
- Perform subframe configuration

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN7.0 Basic Features and Algorithms

Content

- Overview of Beamforming
- Beamforming-Related Concepts
- Beamforming Principles and Techniques
- Beamforming Feature Application Scenarios
- Beamforming Deployment
- Concept of Sector, cell and TDD Subframe Configuration
- TDD Frame Structure
- Uplink-Downlink Subframe Configurations
- Configurations of Special Subframes
- When to Use Subframe Configuration
- Subframe Configuration Deployment

Training Methods

Lectures

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.10 OEO54 LTE eRAN3.0 Performance Improving Features and Algorithms



Objectives

On completion of this course, the participants will be able to:

- Describe admission control
- Set admission control
- Describe congestion control
- Outline load monitoring
- Outline load balance
- Describe intra - frequency load balance
- Describe inter-frequency load balance
- Describe inter-RAT load balance
- Outline compact bandwidth
- Describe key technologies of compact bandwidth
- Describe related physical resource management
- Deploy compact bandwidth
- Outline UL CoMP
- Describe application scenarios of UL CoMP
- Describe key techniques for UL CoMP
- Describe related features of UL CoMP
- Deploy UL CoMP
- Outline ICIC
- Describe downlink ICIC
- Describe uplink ICIC
- Describe ICIC deployment strategy
- Deploy ICIC
- Outline principle and algorithm of RAN Sharing(Optional)

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN3.0 Basic Features and Algorithms

Content

- Load Monitoring
- Admission Control
- Non-GBR Service Admission Control
- GBR Service Admission Flow
- QoS Satisfaction Rate Based Admission Control
- Congestion Control
- Load Balance Overview
- Intra - frequency Load Balance
- Inter-frequency Load Balance
- Inter - RAT Load Balance
- Overview of Compact Bandwidth
- Key Technologies of Compact Bandwidth
- Related Physical Resource Management
- Benefit of UL CoMP
- Principle for UL CoMP
- Application scenario of UL CoMP
- Engineering Guidelines of UL CoMP
- Overview of ICIC
- Downlink ICIC
- Uplink ICIC
- ICIC Deployment Strategy
- Overview of RAN Sharing
- RAN Sharing with Common Carriers
- RAN Sharing with Dedicated Carriers
- Engineering Guidelines of RAN Sharing

Training Methods

Lectures

Duration

2 working days

Class Size

Min 6, max 12

1.3.11 OEO64 LTE eRAN6.0 Performance Improving Features and Algorithms



Objectives

On completion of this course, the participants will be able to:

- Describe admission control
- Set admission control
- Describe congestion control
- Outline load monitoring
- Outline load balance
- Describe intra - frequency load balance
- Describe inter-frequency load balance
- Describe inter-RAT load balance
- Outline compact bandwidth
- Describe key technologies of compact bandwidth
- Describe related physical resource management
- Deploy compact bandwidth
- Outline UL CoMP
- Describe application scenarios of UL CoMP
- Describe key techniques for UL CoMP
- Describe related features of UL CoMP
- Deploy UL CoMP
- Outline ICIC
- Describe downlink ICIC
- Describe uplink ICIC
- Describe ICIC deployment strategy
- Deploy ICIC
- Outline principle and algorithm of RAN Sharing(Optional)

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN6.0 Basic Features and Algorithms

Content

- Load Monitoring
- Admission Control
- Non-GBR Service Admission Control
- GBR Service Admission Flow
- QoS Satisfaction Rate Based Admission Control
- Congestion Control
- Load Balance Overview
- Intra - frequency Load Balance
- Inter-frequency Load Balance
- Inter - RAT Load Balance
- Overview of Compact Bandwidth
- Key Technologies of Compact Bandwidth
- Related Physical Resource Management
- Benefit of UL CoMP
- Principle for UL CoMP
- Application scenario of UL CoMP
- Engineering Guidelines of UL CoMP
- Overview of ICIC
- Downlink ICIC
- Uplink ICIC
- ICIC Deployment Strategy
- Overview of RAN Sharing
- RAN Sharing with Common Carriers
- RAN Sharing with Dedicated Carriers
- Engineering Guidelines of RAN Sharing

Training Methods

Lectures

Duration

2 working days

Class Size

Min 6, max 12

1.3.12 OEO74 LTE eRAN7.0 Performance Improving Features and Algorithms



Objectives

On completion of this course, the participants will be able to:

- Describe admission control
- Set admission control
- Describe congestion control
- Outline load monitoring
- Outline load balance
- Describe intra - frequency load balance
- Describe inter-frequency load balance
- Describe inter-RAT load balance
- Outline compact bandwidth
- Describe key technologies of compact bandwidth
- Describe related physical resource management
- Deploy compact bandwidth
- Outline UL CoMP
- Describe application scenarios of UL CoMP
- Describe key techniques for UL CoMP
- Describe related features of UL CoMP
- Deploy UL CoMP
- Outline ICIC
- Describe downlink ICIC
- Describe uplink ICIC
- Describe ICIC deployment strategy
- Deploy ICIC
- Outline principle and algorithm of RAN Sharing(Optional)

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:

- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN7.0 Basic Features and Algorithms

Content

- Load Monitoring
- Admission Control
- Non-GBR Service Admission Control
- GBR Service Admission Flow
- QoS Satisfaction Rate Based Admission Control
- Congestion Control
- Load Balance Overview
- Intra - frequency Load Balance
- Inter-frequency Load Balance
- Inter - RAT Load Balance
- Overview of Compact Bandwidth
- Key Technologies of Compact Bandwidth
- Related Physical Resource Management
- Benefit of UL CoMP
- Principle for UL CoMP
- Application scenario of UL CoMP
- Engineering Guidelines of UL CoMP
- Overview of ICIC
- Downlink ICIC
- Uplink ICIC
- ICIC Deployment Strategy
- Overview of RAN Sharing
- RAN Sharing with Common Carriers
- RAN Sharing with Dedicated Carriers
- Engineering Guidelines of RAN Sharing

Training Methods

Lectures

Duration

2 working days

Class Size

Min 6, max 12

1.3.13 OEO57 LTE eRAN3.0 Enhanced Features



Objectives

On completion of this course, the participants will be able to:

- Describe enhanced and new functions in Handover Feature from eRAN2.1/2.2 to eRAN3.0
- Introduce enhanced functions in RAN Sharing(Optional)

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:

- LTE eRAN2.1/2.2 Features and Algorithms

Content

- LTE eRAN3.0 Handover Feature
- Coverage Based Inter-frequency Handover
- Handover Based on SPID
- LTE eRAN3.0 RAN Sharing Feature(Optional according to the practical network)
- RAN Sharing with Common Carrier

Training Methods

Lectures

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.14 OEO56 LTE eRAN3.0 New Features



Objectives

On completion of this course, the participants will be able to:

- Outline new functions in CSFB Feature in eRAN3.0
- Explain UL CoMP Feature in eRAN3.0
- Describe 800M self-interference cancellation in eRAN3.0(Optinal)

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE eRAN2.1/2.2 Features and Algorithms

Content

- LTE eRAN3.0 Handover Feature
- Distance Based Inter-frequency Handover
- Service Based Inter-frequency Handover
- Distance based Inter-RAT handover to UTRAN

- Distance based Inter-RAT handover to GERAN
- E-UTRAN to UTRAN CS/PS Steering
- LTE eRAN3.0 CS Fallback Feature
- CS Fallback with LAI to UTRAN
- CS Fallback with LAI to GERAN
- LTE eRAN3.0 UL CoMP feature
- Benefit of UL CoMP feature
- Application scenario of UL CoMP feature
- LTE eRAN3.0 800M self-interference cancellation (Optinal according to the practical network)
- Introduce of self interference
- Application scenarios
- Technologies for self - interference cancellation

Training Methods

Lectures

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.15 OEO67 LTE eRAN6.0 Enhanced Features



Objectives

On completion of this course, the participants will be able to:

- Describe enhanced functions in Handover Feature from eRAN3.0 to eRAN6.0
- Describe enhanced and new functions in CS Fallback from eRAN3.0 to eRAN6.0
- Describe enhanced functions in Cell Outage Detection from eRAN3.0 to eRAN6.0

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE eRAN3.0 Basic Features and Algorithms

Content

- LTE eRAN6.0 Handover Feature
- Coverage Based Inter-frequency/ Inter-RAT Handover
- LTE eRAN6.0 CS Fallback
- CS Fallback to UTRAN
- Flash CS Fallback to UTRAN
- Flash CS Fallback to GERAN
- LTE eRAN6.0 Cell Outage Detection
- Detecting Sleeping Cell rapidly by eNodeB Audit Analysis

Training Methods

Lectures

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.16 OEO66 LTE eRAN6.0 New Features



Objectives

On completion of this course, the participants will be able to:

- Describe new functions in DRX and Signaling Control from eRAN3.0 to eRAN6.0
- Describe new features in eRAN6.0

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE eRAN3.0 Basic Features and Algorithms

Content

- LTE eRAN6.0 CS Fallback
- CS Fallback Steering to GERAN

- CS Fallback Steering to UTRAN
- LTE eRAN6.0 DRX and Signaling Control
- Dynamic DRX
- LTE eRAN6.0 Carrier Aggregation Feature
- CA Basic Concepts and Principles
- CA Feature Benefit and Influence
- CA Feature Deployment and Configuration
- LTE eRAN6.0 eICIC
- eICIC Basic Concepts and Principles
- eICIC Feature Benefit and Influence
- eICIC Feature Deployment and Configuration

Training Methods

Lectures

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.17 OEO77 LTE eRAN7.0 Enhanced Features



Objectives

On completion of this course, the participants will be able to:

- Describe enhanced functions in Handover Feature from eRAN6.0 to eRAN7.0
- Describe enhanced and new functions in scheduling from eRAN6.0 to eRAN7.0
- Describe enhanced functions in MLB from eRAN6.0 to eRAN7.0

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE eRAN6.0 Basic Features and Algorithms

Content

- RIM Based LTE Target Cell Selection
- Coverage Based Inter-frequency/ Inter-RAT Handover
- LTE enhanced scheduling: MBR>GBR
- User number based MLB

Training Methods

Lectures

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.18 OEO76 LTE eRAN7.0 New Features



Objectives

On completion of this course, the participants will be able to:

- Describe new functions in SFN and scheduling from eRAN6.0 to eRAN7.0
- Describe new features in eRAN7.0

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:

- LTE eRAN6.0 Basic Features and Algorithms

Content

- SFN (Single frequency network)
- Uplink timing
- Coordinated Scheduling based power control
- Intelligent Access Class Control

Training Methods

Lectures

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.19 OEO01 LTE Network Tuning



Objectives

On completion of this course, the participants will be able to:

- Describe basic process of RF optimization
- Make test preparations
- Collect data collection for tuning
- List factors affecting coverage
- List solutions for weak coverage
- List solutions for cross coverage
- List solutions for lack of dominant cell
- Perform basic coverage problem analysis
- List main handover problems during network tuning
- Perform basic handover problem analysis
- Perform basic RF adjustment

Target Audience

Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures

Content

- Overview of RF Optimization

- Basic Process of RF Optimization
- Test Preparations
- Data Collection
- Coverage Problem Analysis
- Handover Problem Analysis
- RF Adjustment
- Huawei GENEX Series Tools Introduction
- GENEX Probe Introduction
- GENEX Probe Operation Process
- GENEX Probe Test Parameters
- GENEX Probe Additional Function and Operation
- GENEX Probe Cases Analysis
- GENEX Probe Test Suggestion
- GENEX Assistant Introduction
- GENEX Assistant Operation Process
- GENEX Assistant Additional Function and Operation
- GENEX Assistant Cases Analysis

Training Methods

Lectures, Demo

Duration

1 working day

Class Size

Min 6, max 12

1.3.20 OEO03 LTE Performance Management



Objectives

On completion of this course, the participants will be able to:

- Describe the structure of LTE performance measurement system
- List classification of KPI
- Describe accessibility KPI and detail the counters of it
- Describe retainability KPIs and detail the counters of them
- Describe mobility KPIs and detail the counters of them
- Describe service integrity
- Describe utilization KPIs and detail the counters of them
- Describe availability KPIs and detail the counters of them
- Describe traffic KPI and detail the counters of them
- Describe performance management basic concepts
- Describe measurement management
- Implement performance measurement operations on M2000
- Implement custom counter management
- Query performance result

Target Audience

Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:

- LTE Air Interface
- LTE Protocols and Procedures
- LTE Basic Features and Algorithms

Content

- The structure of LTE performance measurement system
- The main KPI in LTE, and detail the counters for the key KPI, such as accessibility, retainability, mobility, availability, utilization, traffic, latency, Integrity
- Implement performance measurement operations on M2000
- LTE KPI Overview
- Classification of KPI
- Performance Measurement System
- LTE KPI Details
- Accessibility KPI
- Retainability KPIs
- Mobility KPIs
- Equipment Related
- Utilization KPIs / Traffic KPI
- Transport Performance Counter
- LTE KPI Report Delivery

Training Methods

Lectures, Hands-on Exercise

Duration

1 working day

Class Size

Min 6, max 12

1.3.21 OEO06 LTE Radio Network Optimize



Objectives

On completion of this course, the participants will be able to:

- Outline handover procedure
- Perform handover fault analysis
- Describe typical case of handover fault
- Describe basic principle of access
- Describe fault diagnosis process
- Perform operations of fault diagnosis
- Perform checking hardware connections
- Perform checking version mapping
- Perform checking the eNodeB configuration
- Perform checking quality on the air interface
- Perform checking the EPC configuration
- Describe time and frequency resources and throughput calculation
- Describe throughput fault diagnosis procedures and methods
- Describe processes of data transmission fault diagnosis
- Describe basic requirements for fault diagnosis
- Perform diagnosis for locating downlink data transmission faults
- Perform diagnosis for uplink problems

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface

- LTE Protocols and Procedures
- LTE Basic Features and Algorithms

Content

- Basic Principle of Access
- Access Fault Diagnosis Process
- Operations of Access Fault Diagnosis
- Checking Hardware Connections
- Checking Version Mapping
- Checking the eNodeB Configuration
- Checking Quality on the Air Interface
- Checking the EPC Configuration
- Handover Procedure Review
- Handover Fault Analysis
- Typical Case of Handover Fault
- Call Drop Fault Diagnosis Process
- Operations of Call Drop Fault Diagnosis
- Checking Hardware Connections
- Checking Version Mapping
- Checking the eNodeB Configuration
- Checking Quality on the Air Interface
- Checking the EPC Configuration
- Methodology of Traffic Fault Diagnosis
- Air Interface Fault diagnosis
- UDP Fault Diagnosis
- TCP Fault Diagnosis

Training Methods

Lectures

Duration

2 working days

Class Size

Min 6, max 12

1.3.22 OE025 LTE Interoperability



Objectives

- On completion of this course, the participants will be able to:
- Outline challenges for LTE interoperability
 - Describe GUL interoperability network architecture and interfaces
 - Describe IRAT PLMN selection process, cell selection/selection process and signaling procedure in idle mode
 - Describe IRAT measurement triggering/stopping phase, measurement phase, execution phase and signaling procedure in connection mode
 - Application and realization of IRAT

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures

Content

- LTE Interoperability in Idle Mode Overview
- IRAT PLMN Selection Procedure
- IRAT Cell Selection Criteria
- IRAT Cell Reselection Criteria
- IRAT Signaling Procedure in Idle Mode
- Technical Overview and Basic Concepts
- Measurement Configuration
- Measurement Triggering/Stopping Phase of an IRAT Handover
- Redirection
- Blind Handover
- Measurement Phase of an IRAT Handover
- Decision Phase of an IRAT Handover
- Execution Phase of an IRAT Handover
- IRAT Signaling Procedure in Connection Mode

Training Methods

Lectures

Duration

1 working day

Class Size

Min 6, max 12

1.4 RNP Training Course Descriptions

1.4.1 OEP01 LTE Radio Network Design



Objectives

On completion of this course, the participants will be able to:

- Outline LTE radio network planning
- Describe LTE radio network planning Process
- Describe differences between 2G/3G and LTE Dimensioning
- Perform LTE radio network coverage dimensioning
- Perform LTE link budget
- Describe propagation model
- Perform site number dimensioning
- Outline capacity dimensioning procedure
- Describe traffic model and parameters
- Perform radio network throughput calculation
- Analysis DL Throughput
- Analysis UL Throughput
- Perform throughput per cell(IP) dimensioning
- Perform capacity dimensioning
- Outline frequency planning
- Outline TA planning
- Outline PCI planning
- Outline PRACH planning

Target Audience

Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures

Content

- LTE Radio Network Planning Introduction
- LTE Radio Network Planning Process
- Differences between 2G/3G and LTE Dimensioning
- LTE Radio Network Coverage Dimensioning
- LTE Link Budget
- Propagation Model
- Site Number Dimensioning
- Capacity Dimensioning Procedure
- Network Throughput
- Introduction of Traffic Model
- Traffic Model and Parameters
- Network Throughput Calculation
- Cell Throughput
- DL Throughput Analysis
- UL Throughput Analysis
- Throughput per Cell(IP)
- Capacity Dimensioning
- LTE Planning Overview
- Frequency Planning
- TA Planning
- PCI Planning
- PRACH Planning

Training Methods

Lectures, Demo

Duration

1.67 working days

Class Size

Min 6, max 12

1.4.2 OEP02 LTE Access Transport Network Dimensioning



Objectives

On completion of this course, the participants will be able to:

- Describe the LTE transport networking
- Describe the S1 and X2 interface protocol
- Explain IP functionality, such as VLAN, IP sec etc.
- Perform transport network dimensioning
- Perform eNodeB hardware dimensioning

Target Audience

Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:

- LTE Air Interface
- LTE Protocols and Procedures

Content

- Transport Architecture and Networking
- IP Transport Functionality
- IP Transport Dimensioning

Training Methods

Lectures

Duration

0.33 working day

Class Size

Min 6, max 12



1.5 Product Training Course Descriptions

1.5.1 OEB50 eNodeB V100R005 Product Description



Objectives

On completion of this course, the participants will be able to:

- Describe the hardware structure of eNodeB
- Describe the logical structure of eNodeB
- Describe the working principle and functions of eNodeB boards

Target Audience

System Technician
Service Technician
System Engineer
Service Engineer

Prerequisites

- Successful completion of the following courses:

- LTE System Overview

Content

- eNodeB System Overview
- eNodeB System Structure
- eNodeB Auxiliary Devices
- eNodeB Typical Networking

Training Methods

Lectures

Duration

0.5 working day

Class Size

Min 6, max 12

1.5.2 OEB60 eNodeB V100R006 Product Description



Objectives

On completion of this course, the participants will be able to:

- Describe the hardware structure of eNodeB
- Describe the logical structure of eNodeB
- Describe the working principle and functions of eNodeB boards

Target Audience

System Technician
Service Technician
System Engineer
Service Engineer

Prerequisites

- Successful completion of the following courses:

- LTE System Overview

Content

- eNodeB System Overview
- eNodeB System Structure
- eNodeB Auxiliary Devices
- eNodeB Typical Networking

Training Methods

Lectures

Duration

0.5 working day

Class Size

Min 6, max 12

1.5.3 OEB70 eNodeB V100R007 Product Description



Objectives

On completion of this course, the participants will be able to:

- Describe the hardware structure of eNodeB
- Describe the logical structure of eNodeB
- Describe the working principle and functions of eNodeB boards

Target Audience

System Technician
Service Technician
System Engineer
Service Engineer

Prerequisites

- Successful completion of the following courses:

- LTE System Overview

Content

- eNodeB System Overview
- eNodeB System Structure
- eNodeB Auxiliary Devices
- eNodeB Typical Networking

Training Methods

Lectures

Duration

0.5 working day

Class Size

Min 6, max 12

1.5.4 OEB51 eNodeB V100R005 Local Commissioning



Objectives

On completion of this course, the participants will be able to:

- Describe the procedure of eNodeB commissioning
- Describe the related concept of eNodeB software and configuration file
- Querying the current version of eNodeB
- Use USB disk to commission the eNodeB
- Commission the eNodeB through LMT
- Verify commissioning result

Target Audience

System Technician
Service Technician
System Engineer
Service Engineer

Prerequisites

Successful completion of the following courses:

- LTE System Overview
- eNodeB LTE V100R005 Product Description

Content

- eNodeB Commissioning Overview

- eNodeB Local Commissioning through the USB Disk
- Procedure for the Local Commissioning through the USB Disk
- Download and Activate the Software and Data Configuration File
- eNodeB Local Commissioning on the LMT
- Prepare for the Local eNodeB Commissioning on the LMT
- Upgrade the eNodeB Software and Data Configuration File on the LMT
- Download the License on the LMT
- Query the Running Status
- Establish an operation and maintenance Link Between the M2000 and the eNodeB

Training Methods

Lectures, Hands-on Exercise

Duration

1 working day

Class Size

Min 6, max 12

1.5.5 OEB61 eNodeB V100R006 Local Commissioning



Objectives

On completion of this course, the participants will be able to:

- Describe the procedure of eNodeB commissioning
- Describe the related concept of eNodeB software and configuration file
- Querying the current version of eNodeB
- Use USB disk to commission the eNodeB
- Commission the eNodeB through LMT
- Verify commissioning result

Target Audience

System Technician
Service Technician
System Engineer
Service Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R006 Product Description

Content

- eNodeB Commissioning Overview

- eNodeB Local Commissioning through the USB Disk
- Procedure for the Local Commissioning through the USB Disk
- Download
- Activate the Software and Data Configuration File
- eNodeB Local Commissioning on the LMT
- Prepare for the Local eNodeB Commissioning on the LMT
- Upgrade the eNodeB Software and Data Configuration File on the LMT
- Download the License on the LMT
- Query the Running Status
- Establish an O
- M Link Between the M2000 and the eNodeB

Training Methods

Lectures、 Hands-on Exercise

Duration

1 working day

Class Size

Min 6, max 12

1.5.6 OEB71 eNodeB V100R007 Local Commissioning



Objectives

On completion of this course, the participants will be able to:

- Describe the procedure of eNodeB commissioning
- Describe the related concept of eNodeB software and configuration file
- Querying the current version of eNodeB
- Use USB disk to commission the eNodeB
- Commission the eNodeB through LMT
- Verify commissioning result

Target Audience

System Technician
Service Technician
System Engineer
Service Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R007 Product Description

Content

- eNodeB Commissioning Overview

- eNodeB Local Commissioning through the USB Disk
- Procedure for the Local Commissioning through the USB Disk
- Download
- Activate the Software and Data Configuration File
- eNodeB Local Commissioning on the LMT
- Prepare for the Local eNodeB Commissioning on the LMT
- Upgrade the eNodeB Software and Data Configuration File on the LMT
- Download the License on the LMT
- Query the Running Status
- Establish an O
- M Link Between the M2000 and the eNodeB

Training Methods

Lectures、 Hands-on Exercise

Duration

1 working day

Class Size

Min 6, max 12

1.5.7 OEB52 eNodeB V100R005 Field Maintenance



Objectives

On completion of this course, the participants will be able to:

- Power up/down the eNodeB and connect up LMT to the node
- Find the alarm list of eNodeB
- Perform corrective and preventive maintenance on eNodeB
- Find faulty hardware units and replace them

Target Audience

Network Deployment Engineer
Field Technician
System Technician

Prerequisites

- Successful completion of the following courses:
- LTE System Overview

- eNodeB LTE V100R005 Product Description

Content

- Powering up/down the eNodeB and connect up LMT to the node
- Finding the alarm list of eNodeB
- Perform corrective and preventive maintenance on eNodeB
- Finding Faulty Hardware units and replace them

Training Methods

Lectures、 Hands-on Exercise

Duration

0.5 working day

Class Size

Min 6, max 12

1.5.8 OEB62 eNodeB V100R006 Field Maintenance



Objectives

On completion of this course, the participants will be able to:

- Power up/down the eNodeB and connect up LMT to the node
- Find the alarm list of eNodeB
- Perform corrective and preventive maintenance on eNodeB
- Find faulty hardware units and replace them

Target Audience

Network Deployment Engineer
Field Technician
System Technician

Prerequisites

- Successful completion of the following courses:
- LTE System Overview

- eNodeB LTE V100R006 Product Description

Content

- Powering up/down the eNodeB and connect up LMT to the node
- Finding the alarm list of eNodeB
- Perform corrective and preventive maintenance on eNodeB
- Finding Faulty Hardware units and replace them

Training Methods

Lectures、 Hands-on Exercise

Duration

0.5 working day

Class Size

Min 6, max 12

1.5.9 OEB72 eNodeB V100R007 Field Maintenance



Objectives

On completion of this course, the participants will be able to:

- Understand Huawei power supply and monitoring solutions
- Power up/down the eNodeB and connect up LMT to the node
- Find the alarm list of eNodeB
- Perform corrective and preventive maintenance on eNodeB
- Find faulty hardware units and replace them

Target Audience

Network Deployment Engineer
Field Technician
System Technician

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R007 Product Description

Content

- eNodeB LTE V100R007 Power Supply and

Monitoring

- Basic Concepts about Power and Monitor System
- Component of Power Supply System
- Data configuration of Power System
- Component of Monitor System
- Data configuration for Monitor System
- eNodeB LTE V100R007 Field Maintenance
 - Powering up/down the eNodeB and connect up LMT to the node
 - Finding the alarm list of eNodeB
 - Perform corrective and preventive maintenance on eNodeB
 - Finding Faulty Hardware units and replace them

Training Methods

Lectures

Duration

0.5 working day

Class Size

Min 6, max 12

1.5.10 OEB53 eNodeB V100R005 Remote Commissioning



Objectives

On completion of this course, the participants will be able to:

- Describe the procedure of eNodeB commissioning
- Describe the related concept of eNodeB software and configuration file
- Querying the current version of eNodeB
- Commission the eNodeB through M2000
- Verify commissioning result

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

Successful completion of the following courses:

- LTE System Overview
- eNodeB LTE V100R005 Product Description

Content

- eNodeB Commissioning Overview
- eNodeB Remote Commissioning on the M2000

Training Methods

Lectures, Hands-on Exercise

Duration

0.5 working day

Class Size

Min 6, max 12

1.5.11 OEB63 eNodeB V100R006 Equipment Commissioning



Objectives

On completion of this course, the participants will be able to:

- Describe the procedure of eNodeB commissioning
- Describe the related concept of eNodeB software and configuration file
- Querying the current version of eNodeB
- Commission the eNodeB through M2000
- Verify commissioning result

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R006 Product Description

Content

- eNodeB Commissioning Overview
- eNodeB Remote Commissioning on the M2000

Training Methods

Lectures、 Hands-on Exercise

Duration

0.5 working day

Class Size

Min 6, max 12

1.5.12 OEB73 eNodeB V100R007 Equipment Commissioning



Objectives

On completion of this course, the participants will be able to:

- Describe the procedure of eNodeB commissioning
- Describe the related concept of eNodeB software and configuration file
- Querying the current version of eNodeB
- Commission the eNodeB through U2000
- Verify commissioning result

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R007 Product Description

Content

- LTE eRAN7.0 Automatic OMCH

Establishment

- Automatic OMCH establishment phase during base station deployment by PnP
- DHCP introduction
- Schemes for Obtaining VLAN Information
- Procedure for Obtaining Configuration Information in different Scenarios
- eNodeB LTE V100R007 Equipment Commissioning
 - eNodeB Commissioning Overview
 - eNodeB local commissioning
 - eNodeB Remote Commissioning

Training Methods

Lectures、 Hands-on Exercise

Duration

0.5 working day

Class Size

Min 6, max 12

1.5.13 OEB54 eNodeB V100R005 Operation



Objectives

On completion of this course, the participants will be able to:

- Explain the architecture and components of eNodeB operation and maintenance system
- Install LMT software
- Install M2000 client software
- Use LMT login eNodeB
- Use M2000 client Login M2000 server and eNodeB
- Execute MML in single mode
- Execute MML in batch mode
- Manage alarms of eNodeB
- Manage device, such as querying board states, blocking board and unblocking board
- Manage software, such as querying current software version and backup configuration file
- Manage transport data, such as querying IP address of Ethernet port and querying IP route
- Manage radio data, such as querying cell states and querying neighbor cell
- Manage tracing message, for example: creating a tracing task, checking tracing result, saving result
- Manage real-time monitoring, for example: creating a monitoring task, checking and saving monitoring result

Target Audience

System Engineers
Service Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R005 Product Description

Content

- Structure of operation and maintenance system
- Login eNodeB O
- M system
- eNodeB equipment management
- eNodeB transport management
- eNodeB radio management
- Backup eNodeB configuration file, query eNodeB version
- Tracing and real time monitoring
- Practise on eNodeB operation

Training Methods

Lectures、 Hands-on Exercise

Duration

1 working day

Class Size

Min 6, max 12

1.5.14 OEB64 eNodeB V100R006 Operation



Objectives

On completion of this course, the participants will be able to:

- Explain the architecture and components of eNodeB operation and maintenance system
- Install LMT software
- Install M2000 client software
- Use LMT login eNodeB
- Use M2000 client Login M2000 server and eNodeB
- Execute MML in single mode
- Execute MML in batch mode
- Manage alarms of eNodeB
- Manage device, such as querying board states, blocking board and unblocking board
- Manage software, such as querying current software version and backup configuration file
- Manage transport data, such as querying IP address of Ethernet port and querying IP route
- Manage radio data, such as querying cell states and querying neighbor cell
- Manage tracing message, for example: creating a tracing task, checking tracing result, saving result
- Manage real-time monitoring, for example: creating a monitoring task, checking and saving monitoring result

Target Audience

System Engineers
Service Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R006 Product Description

Content

- Structure of operation and maintenance system
- Login eNodeB O
- M system
- eNodeB equipment management
- eNodeB transport management
- eNodeB radio management
- Backup eNodeB configuration file, query eNodeB version
- Tracing and real time monitoring
- Practise on eNodeB operation

Training Methods

Lectures、 Hands-on Exercise

Duration

1 working day

Class Size

Min 6, max 12

1.5.15 OEB74 eNodeB V100R007 Operation



Objectives

On completion of this course, the participants will be able to:

- Explain the architecture and components of eNodeB operation and maintenance system
- Install LMT software
- Install U2000 client software
- Use LMT login eNodeB
- Use U2000 client Login U2000 server and eNodeB
- Execute MML in single mode
- Execute MML in batch mode
- Manage alarms of eNodeB
- Manage device, such as querying board states, blocking board and unblocking board
- Manage software, such as querying current software version and backup configuration file
- Manage transport data, such as querying IP address of Ethernet port and querying IP route
- Manage radio data, such as querying cell states and querying neighbor cell
- Manage tracing message, for example: creating a tracing task, checking tracing result, saving result
- Manage real-time monitoring, for example: creating a monitoring task, checking and saving monitoring result

Target Audience

System Engineers
Service Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R007 Product Description

Content

- Structure of operation and maintenance system
- Login eNodeB O&M system
- eNodeB equipment management
- eNodeB transport management
- eNodeB radio management
- Backup eNodeB configuration file, query eNodeB version
- Tracing and real time monitoring
- Practise on eNodeB operation

Training Methods

Lectures、 Hands-on Exercise

Duration

1 working day

Class Size

Min 6, max 12



1.5.16 OEB55 eNodeB V100R005 Initial Configuration



Objectives

On completion of this course, the participants will be able to:

- Outline the procedure of eNodeB data configuration
- Describe the main table of "eNodeB Summary Data"
- Use LTE Configuration System to create project
- Use LTE Configuration System to import external template
- Use LTE Configuration System to query data configuration and modify data
- Use LTE Configuration System to check up data
- Use LTE Configuration System to export data

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

Successful completion of the following courses:

- LTE System Overview
- eNodeB LTE V100R005 Product Description

Content

- eNodeB Data Configuration Introduction
- Preparing eNodeB Data
- Creating eNodeB Data
- Adjusting eNodeB Data
- Checking eNodeB Data
- Exporting eNodeB Data
- SUMMARY introduction
- Creating bulk eNodeBs with Summary
- Checking data

Training Methods

Lectures, Hands-on Exercise

Duration

1 working day

Class Size

Min 6, max 12

1.5.17 OEB65 eNodeB V100R006 Initial Configuration



Objectives

On completion of this course, the participants will be able to:

- Outline the procedure of eNodeB data configuration
- Describe the main table of "eNodeB Summary Data"
- Use LTE Configuration System to create project
- Use LTE Configuration System to import external template
- Use LTE Configuration System to query data configuration and modify data
- Use LTE Configuration System to check up data
- Use LTE Configuration System to export data

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R006 Product Description

Content

- eNodeB Data Configuration Introduction
- Common Data Parameters Introduction
- Data Preparation in Specific Scenarios
- Practise on
 - a).eNodeB data configuration preparation
 - b).MML for common data
 - c).MML for device data
 - d).MML for transmission data
 - e).MML for radio data
 - f).MML for specific scenario
- eNodeB Data Configuration by CME Introduction
 - Preparing eNodeB Data
 - Creating eNodeB Data
 - Adjusting eNodeB Data
 - Checking eNodeB Data
 - Exporting eNodeB Data
 - Practise on eNodeB data configuration file preparation by CME

Training Methods

Lectures、 Hands-on Exercise

Duration

3 working days

Class Size

Min 6, max 12

1.5.18 OEB75 eNodeB V100R007 Initial Configuration



Objectives

On completion of this course, the participants will be able to:

- Outline the procedure of eNodeB data configuration
- Understand the meaning of data for initial configuration
- Describe the main table of "eNodeB Summary Data"
- Use LTE Configuration System to create project
- Use LTE Configuration System to import external template
- Use LTE Configuration System to query data configuration and modify data
- Use LTE Configuration System to check up data
- Use LTE Configuration System to export data

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R007 Product Description

Content

- eNodeB Data Configuration Introduction
- Common Data Parameters Introduction
- Data Preparation in Specific Scenarios
- Practise on
 - a).eNodeB data configuration preparation
 - b).MML for common data
 - c).MML for device data
 - d).MML for transmission data
 - e).MML for radio data
 - f).MML for specific scenario
- eNodeB Data Configuration by CME Introduction
 - Preparing eNodeB Data
 - Creating eNodeB Data
 - Adjusting eNodeB Data
 - Checking eNodeB Data
 - Exporting eNodeB Data
- Practise on eNodeB data configuration file preparation by CME

Training Methods

Lectures、 Hands-on Exercise

Duration

3 working days

Class Size

Min 6, max 12

1.5.19 OEB56 eNodeB V100R005 Troubleshooting



Objectives

On completion of this course, the participants will be able to:

- Outline the procedure of eNodeB troubleshooting flow
- Perform the alarm management and analysis
- Perform the log collection
- Draw hardware fault handling procedure
- Handle with the main faults of device level
- Draw transport fault handling procedure
- Handle with the main faults of transport level
- Draw radio fault diagnosis process
- Check the eNodeB radio configuration
- Check quality on the air interface
- Check the EPC configuration
- Handle with the main faults of radio level

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview

- eNodeB LTE V100R005 Product Description
- eNodeB LTE V100R005 Reconfiguration

Content

- The procedure of eNodeB troubleshooting flow
- The alarm management and analysis
- The log collection
- The main faults processing of device level
- The main faults processing of transport level
- The main faults processing of radio level
- The TOP N alarms are picked from the engineering projects. By presenting the description, system impact, possible causes, and handling procedure of the TOP N alarms, give an overview of how to recognize and analyze alarms. Finally, cases about alarms handling are given for trainees to have a reference in practical maintenance work about alarms.

Training Methods

Lectures、 Hands-on Exercise

Duration

1 working day

Class Size

Min 6, max 12

1.5.20 OEB66 eNodeB V100R006 Troubleshooting



Objectives

On completion of this course, the participants will be able to:

- Outline the procedure of eNodeB troubleshooting flow
- Perform the alarm management and analysis
- Perform the log collection
- Draw hardware fault handling procedure
- Handle with the main faults of device level
- Draw transport fault handling procedure
- Handle with the main faults of transport level
- Draw radio fault diagnosis process
- Check the eNodeB radio configuration
- Check quality on the air interface
- Check the EPC configuration
- Handle with the main faults of radio level

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R006 Product Description
- eNodeB LTE V100R006 Reconfiguration
- eNodeB LTE V100R006 Initial Configuration

Content

- The procedure of eNodeB troubleshooting flow
- The alarm management and analysis
- The log collection
- The main faults processing of device level
- The main faults processing of transport level
- The main faults processing of radio level
- The TOP N alarms are picked from the engineering projects. By presenting the description, system impact, possible causes, and handling procedure of the TOP N alarms, give an overview of how to recognize and analyze alarms. Finally, cases about alarms handling are given for trainees to have a reference in practical maintenance work about alarms.
- LTE common fault analysis methods and process steps
- Help trainees understand LTEStar troubleshooting process and grasp LTEStar troubleshooting methods through practise

Training Methods

Lectures、 Hands-on Exercise

Duration

2 working days

Class Size

Min 6, max 12

1.5.21 OEB76 eNodeB V100R007 Troubleshooting



Objectives

On completion of this course, the participants will be able to:

- Outline the procedure of eNodeB troubleshooting flow
- Perform the alarm management and analysis
- Perform the log collection
- Draw hardware fault handling procedure
- Handle with the main faults of device level
- Draw transport fault handling procedure
- Handle with the main faults of transport level
- Draw radio fault diagnosis process
- Check the eNodeB radio configuration
- Check quality on the air interface
- Check the EPC configuration
- Handle with the main faults of radio level

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R007 Product Description
- eNodeB LTE V100R007 Initial Configuration

Content

- The procedure of eNodeB troubleshooting flow
- The alarm management and analysis
- The log collection
- The main faults processing of device level
- The main faults processing of transport level
- The main faults processing of radio level
- The TOP N alarms are picked from the engineering projects. By presenting the description, system impact, possible causes, and handling procedure of the TOP N alarms, give an overview of how to recognize and analyze alarms. Finally, cases about alarms handling are given for trainees to have a reference in practical maintenance work about alarms.
- LTE common fault analysis methods and process steps
- Help trainees understand LTEStar troubleshooting process and grasp LTEStar troubleshooting methods through practise

Training Methods

Lectures、 Hands-on Exercise

Duration

2 working days

Class Size

Min 6, max 12

1.5.22 NA eNodeB LTE V100R007 Troubleshooting of Transmission



Objectives

On completion of this program, the participants will be able to:

- Draw transport fault handling procedure
- Handle with the main faults of transport level

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview

- eNodeB LTE V100R007 Product Description
- eNodeB LTE V100R007 Reconfiguration
- eNodeB LTE V100R007 Troubleshooting

Training Content

- eNodeB LTE V100R007 Troubleshooting of Transmission
 - eNodeB LTE V100R007 troubleshooting of transmission

Duration

0.5 working days

Class Size

Min 6, Max 12

1.5.23 NA eNodeB LTE V100R007 Troubleshooting of Antenna & Feeder System



Objectives

On completion of this program, the participants will be able to:

- Draw radio fault diagnosis process
- Check the eNodeB radio configuration
- Handle with the main faults of radio level
- Understand Antenna & Feeder system working principle
- Understand PIM fault and perform troubleshooting by U2000 and WebLMT
- Understand VSWR fault and perform troubleshooting by U2000 and WebLMT
- Understand TMA fault and perform troubleshooting by U2000 and WebLMT

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R007 Product Description
- eNodeB LTE V100R007 Reconfiguration
- eNodeB LTE V100R007 Troubleshooting

Training Content

- Basic Introduction to Antenna and Feeder
 - Antenna & Feeder System Components Overview

- Antenna Basic Knowledge
- Feeder and Jumper
- eNodeB LTE V100R007 Antenna & Feeder System Fault Analysis and Troubleshooting
 - LTE Antenna & Feeder System Fault Overview
 - PIM Interference
 - VSWR Fault
 - TMA Fault.
- eNodeB LTE V100R007 Antenna & Feeder System Fault Analysis and Troubleshooting Trainee Manual
 - Practice on Offline VSWR Test by U2000 and WebLMT
 - Practice on DTF Test of the Antenna VSWR by U2000 and WebLMT
 - Practice on Crossed Pair Detection by U2000 and WebLMT
 - Practise on 2-Tone-based Intermodulation Detection by U2000 and WebLMT
 - Practise on Service-based Intermodulation Detection by U2000 and WebLMT
 - Practise on DTP Test by U2000 and WebLMT

Duration

1.5 working days

Class Size

Min 6, Max 12

1.5.24 OEB57 eNodeB V100R005 Reconfiguration



Objectives

On completion of this course, the participants will be able to:

- Outline CME/MML operation
- Perform capacity expansion
- Perform adding an FDD cell
- Perform changing the cell bandwidth
- Perform adding an MME Connection
- Perform adding an S-GW Connection
- Perform network reconstruction
- Perform changing the cell EARFCNs
- Perform changing the Cell PCI
- Perform changing the Cell ID
- Perform relocating an MME
- Perform relocating an S-GW

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview

- eNodeB LTE V100R005 Product Description

Content

- CME/MML Command Operation Instructions
- Capacity Expansion
- Adding an FDD Cell
- Changing the Cell Bandwidth
- Adding an MME Connection
- Adding an S-GW Connection
- Network Reconstruction
- Changing the Cell EARFCNs
- Changing the Cell PCI
- Changing the Cell ID
- Relocating an MME
- Relocating an S-GW
- Practise on eNodeB V100R005 reconfiguration

Training Methods

Lectures, Hands-on Exercise

Duration

1 working day

Class Size

Min 6, max 12

1.5.25 OEB67 eNodeB V100R006 Reconfiguration



Objectives

On completion of this course, the participants will be able to:

- Outline CME/MML operation
- Perform capacity expansion
- Perform adding an FDD cell
- Perform changing the cell bandwidth
- Perform adding an MME Connection
- Perform adding an S-GW Connection
- Perform network reconstruction
- Perform changing the cell EARFCNs
- Perform changing the Cell PCI
- Perform changing the Cell ID
- Perform relocating an MME
- Perform relocating an S-GW

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview

- eNodeB LTE V100R006 Product Description

Content

- CME/MML Command Operation Instructions
- Capacity Expansion
- Adding an FDD Cell
- Changing the Cell Bandwidth
- Adding an MME Connection
- Adding an S-GW Connection
- Network Reconstruction
- Changing the Cell EARFCNs
- Changing the Cell PCI
- Changing the Cell ID
- Relocating an MME
- Relocating an S-GW
- Practise on eNodeB V100R006 reconfiguration

Training Methods

Lectures, Hands-on Exercise

Duration

1 working day

Class Size

Min 6, max 12

1.5.26 OEB77 eNodeB V100R007 Reconfiguration



Objectives

On completion of this course, the participants will be able to:

- Outline CME features for data management
- Outline CME/MML operation
- Perform capacity expansion
- Perform adding an FDD cell
- Perform changing the cell bandwidth
- Perform adding an MME Connection
- Perform adding an S-GW Connection
- Perform network reconstruction
- Perform changing the cell EARFCNs
- Perform changing the Cell PCI
- Perform changing the Cell ID
- Perform relocating an MME
- Perform relocating an S-GW

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R007 Product Description
- eNodeB LTE V100R007 Initial Configuration

Content

- U2000-CME V200R014 Introduction
 - CME Overview Introduction
 - Features of the CME
 - ◇ Area Management
 - ◇ Template Management
 - ◇ Feature OM Management
 - ◇ Data Check
 - ◇ Script Executor
 - ◇ Data Fallback
 - CME Configuration Scenarios
 - ◇ Base Station Initial Configuration
 - ◇ Network Reconfiguration
- eNodeB LTE V100R007 Reconfiguration
 - Reconfiguration Working Flow
 - Reconfiguration Tools and Operation
 - Radio/Device Data Reconfiguration
 - Data Reconfiguration in Typical Scenarios
 - Practise on reconfiguration based on given radio/device data environment

Training Methods

Lectures、 Hands-on Exercise

Duration

2 working day

Class Size

Min 6, max 12

1.5.27 OEB58 LTE eRAN3.0 O&M Enhancement



Objectives

On completion of this course, the participants will be able to:

- Outline the new hardware
- Describe O
- M new and enhanced functions

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB V100R004 Data Configuration

Content

- LTE eRAN3.0 Hardware Delta
- New BBU Board
- New RRU Board
- LTE eRAN3.0 O
- M Enhancement
- Describe LMT delta functions
- Describe M2000 client delta functions

Training Methods

Lectures

Duration

0.5 working day

Class Size

Min 6, max 12

1.5.28 OEB68 LTE eRAN6.0 Product Delta



Objectives

On completion of this course, the participants will be able to:

- Describe LMT delta functions
- Describe M2000 client delta functions

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB V100R005 Data Configuration

Content

- LMT Delta Functions

- M2000 Delta Functions
- Change in O
- M between eRAN3.0 and eRAN6.0
- Change in radio configuration from eRAN3.0 to eRAN6.0
- Change in transport EP mode configuration from eRAN3.0 to eRAN6.0
- Complete eRAN6.0 radio configuration task
- Complete eRAN6.0 transport EP mode configuration tasks

Training Methods

Lectures

Duration

1 working day

Class Size

Min 6, max 12

1.5.29 OEB78 LTE eRAN7.0 Product Delta



Objectives

On completion of this program, the participants will be able to:

- Describe eRAN7.0 new hardware
- Describe eRAN7.0 new O&M functions and feature
- Describe multi-BBU interconnection feature
- Describe USU hardware and its implementation in multi-BBU interconnection feature

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:

- LTE eRAN6.0 Operation and Configuration Training

Training Content

- eNodeB LTE V100R007 Delta for Hardware
 - LMT Delta Functions
 - U2000 Delta Functions
- eNodeB LTE V100R007 Delta for O&M
 - Change in O&M between eRAN6.0 and eRAN7.0
- eNodeB LTE V100R007 BBU Interconnection
 - Multi-BBU interconnection feature
 - USU hardware introduction

Duration

1 working day

Class Size

Min 6, Max 12

1.5.30 OET58 LTE eRAN3.0 Transmission Features and Algorithms



Objectives

On completion of this course, the participants will be able to:

- Introduction TRM Algorithms
- Explain transport Resource Configurations and Mapping
- Describe Transport Load Control
- Describe Transmission Security principle
- Explain Transmission Security Mechanisms
- Outline LTE synchronization
- Describe frequency and time synchronization
- List synchronization sources
- Describe working modes of clocks
- Perform synchronization configuration

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- eNodeB V100R005 Initial Configuration

Content

- Overview of Transmission Security
- End-to-End Certificate Management
- Transmission Security Mechanisms
- When to Use Transmission Security
- Transmission Security Deployment
- Overview of TRM Algorithms
- Transport Resource Configurations and Mapping
- Transport Load Control
- Engineering Guidelines of TRM
- Overview of LTE Synchronization
- Frequency and Time Synchronization
- Synchronization Sources
- Selection of Synchronization Sources
- Working Modes of Clocks
- Synchronization Configuration
- Synchronization Activation Observation
- Synchronization Fault Troubleshooting

Training Methods

Lectures

Duration

1 working day

Class Size

Min 6, max 12

1.5.31 OET68 LTE eRAN6.0 Transmission Features and Algorithms



Objectives

On completion of this course, the participants will be able to:

- Introduction TRM Algorithms
- Explain transport Resource Configurations and Mapping
- Describe Transport Load Control
- Describe Transmission Security principle
- Explain Transmission Security Mechanisms
- Outline LTE synchronization
- Describe frequency and time synchronization
- List synchronization sources
- Describe working modes of clocks
- Perform synchronization configuration

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- eNodeB V100R006 Initial Configuration

Content

- Overview of Transmission Security
- End-to-End Certificate Management
- Transmission Security Mechanisms
- When to Use Transmission Security
- Transmission Security Deployment
- Overview of TRM Algorithms
- Transport Resource Configurations and Mapping
- Transport Load Control
- Engineering Guidelines of TRM
- Overview of LTE Synchronization
- Frequency and Time Synchronization
- Synchronization Sources
- Selection of Synchronization Sources
- Working Modes of Clocks
- Synchronization Configuration
- Synchronization Activation Observation
- Synchronization Fault Troubleshooting

Training Methods

Lectures

Duration

1 working day

Class Size

Min 6, max 12

1.5.32 OET78 LTE eRAN7.0 Transmission Features and Algorithms



Objectives

On completion of this program, the participants will be able to:

- Explain TRM features and algorithms
- Explain transmission security solution
- Explain synchronization solution
- Explain S1/X2 Self-Management feature and algorithms
- Explain Automatic OMCH Establishment feature

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- eNodeB V100R007 Product Description

Training Content

- LTE eRAN7.0 Transmission Security Feature
 - Overview of Transmission Security
 - End-to-End Certificate Management
 - Transmission Security Mechanisms
 - When to Use Transmission Security
 - Transmission Security Deployment
- LTE eRAN7.0 Transport Resource Management Feature
 - Overview of TRM Algorithms
 - Transport Resource Configurations and Mapping
 - Transport Load Control
 - Engineering Guidelines of TRM
- LTE eRAN7.0 Synchronization
 - Overview of LTE Synchronization
 - Frequency and Time Synchronization

- Synchronization Sources
- Selection of Synchronization Sources
- Working Modes of Clocks
- Synchronization Configuration
- Synchronization Activation Observation
- Synchronization Fault Troubleshooting
- LTE eRAN7.0 S1/X2 Self-Management
 - Self-Management Overview
 - S1 Interface Self-Management in Generic Scenarios
 - S1 Interface Self-Management in IPSec-enabled Scenarios
 - X2 Interface Self-Management in Generic Scenarios
 - X2 Interface Self-Management in IPSec-enabled Scenarios
- LTE eRAN7.0 Automatic OMCH Establishment
 - Automatic OMCH establishment phase during base station deployment by PnP
 - DHCP introduction
 - Schemes for Obtaining VLAN Information
 - Procedure for Obtaining Configuration Information in different Scenarios

Duration

1.5 working day

Class Size

Min 6, Max 12

1.6 WBT

1.6.1 OEA00 LTE SAE System Overview(WBT)



Objectives

On completion of this course, the participants will be able to:

- Summarize the evolution of 3GPP releases
- Explain the logical architecture of EPS (E-UTRAN and EPC)
- Give an overview of the interfaces in EPS
- Describe the Evolved Packet Core (EPC)
- Describe the role of the MME and the S-GW
- Describe the S1, X2 and radio-interface and their protocol stacks
- Describe the radio interface techniques used in uplink and downlink
- Describe the channel structure of the radio interface
- Describe the time-domain and Frequency-domain structure in the radio interface in UL and DL for both FDD and TDD mode
- Have a good understanding of the OFDM principle, signal generation and processing
- Detail the reference symbols in DL
- Describe MIMO technology
- Have a good understanding of the SC-FDMA principle, signal generation and processing
- Describe Huawei eNodeB Family
- Describe Huawei LTE products and application scenarios
- Describe Huawei LTE products Operation and Maintenance System

Target Audience

All people who want to know LTE principle in brief

Prerequisites

- Basic knowledge of mobile communications

Content

- Network Architecture
- Evolution of Cellular Networks
- 3GPP Releases
- E-UTRAN Architecture
- E-UTRAN Interfaces and Protocols
- EPC Architecture
- EPC Interfaces and Protocols
- LTE Air Interface Principles
- Radio Interface Techniques
- Principles of OFDM
- LTE Channel Structures
- LTE Frame Structure
- Downlink OFDMA
- Uplink SC-FDMA
- Multiple Input Multiple Output
- Multimedia Broadcast Multicast Service
- eNodeB Product Overview
- The Huawei eNodeB family
- Products and application scenarios
- Operation and Maintenance

Training Methods

Lectures

Duration

4hours

Class Size

Min 6, max 12

1.6.2 OEA01 LTE in a Nutshell (WBT)



Objectives

On completion of this course, the participants will be able to:

- Describe the state of wireless networks and trends for next generation wireless networks
- Sketch the System Architecture Evolution (SAE) for LTE and its interfaces
- Describe OFDM concepts and how it is used in LTE
- Define the key features of the LTE air interface
- Walk through the mobile device operations from power-up to service setup
- Explain how uplink and downlink traffic are handled in LTE networks
- Walk through a high level service flow setup on an end-to-end basis
- Explain deployment scenarios of LTE networks

Target Audience

All people who want to know LTE in brief

Prerequisites

- Basic knowledge of mobile communications

Content

- State of wireless networks and trends for next generation wireless networks
- System Architecture Evolution (SAE) for LTE and its interfaces
- OFDM concepts
- Key features of the LTE air interface
- Uplink and downlink traffic are handled in LTE networks
- High level service flow setup on an end-to-end basis
- Deployment scenarios of LTE networks

Training Methods

Lectures

Duration

0.5hour

Class Size

Min 6, max 12

